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to be converted into charcoal, the plan adopted by the Irish Amelioration Society is to carbonise blocks of bog-earth, partially dried on trays of wickerwork, in moveable pyramidal furnaces—in much the same way, indeed, as ordinary charcoal is produced from the branches of trees. The charcoal thus produced varies considerbly in character from the peat from which it had its origin, as well as in the density of some specimens compared with that of others. In stove drying, dense peat loses about one-third, and the light and porous kind as much as one-half its weight; four tons of dried peat not producing much more than one ton of charcoal. When the peat, however, is properly compressed previous to its carbonisation—which a recently-invented machine enables the manufacturer to readily do—the charcoal resulting from the process exceeds in density that made from wood; and for the purposes of iron smelting it is said to be admirably adapted, owing to its great freedom from sulphur. As a purifying and deodorising agent, the charcoal of peat is eminently fitted.

The products of the destructive distillation of peat are as various as they are valuable. The elements of peat are precisely those of wood and coal—nitrogen, hydrogen, oxygen, and carbon. If, therefore, we distil peat in close vessels, the products obtained are precisely similar to those which are obtainable from wood and coal under like circumstances. Till lately the expense attending the distillation of peat has prevented its general adoption. The employment, however, of a recently-invented blast furnace, which differs in principle from that in which iron is melted, by having an arrangement for collecting the products of combustion, has enabled the experimentaliser to obtain ammonia, acetic acid, pyroxylic spirit, tar, naphtha, oils, and paraffine, together with large quantities of inflammable gases from the peat.

These various products are, as is well known, of great use in the arts. Sulphate of ammonia is employed in the preparation of carbonate and muriate of ammonia, in caustic ammonia, and in the manufacture of various manures and fertilising composts; acetate of lime is in constant demand as a source of acetic acid, and of various acetates largely consumed by calico printers; pyroxylic spirit (or wood alcohol), is used in vapour lamps, and in the preparation of several kinds of varnish; naphtha is used extensively for disolving caoutchouc, for making varnishes, and also for burning in lamps; the heavy and fixed oils mentioned are very useful in lubricating machinery, especially when intimately mixed with other oils, or it may be used as a cheap lamp oil for the production of lampblack: and, lastly, the paraffine, when mixed with fatty matter such as sperm and stearine, forms excellent candles.

Here, then, are no fewer than seven different substances producible from the hitherto neglected and dangerous peat-bogs of Ireland, and which only require the exercise of skill and patience, joined with the careful employment of capital, to render them available for all the purposes indicated.

FORMATION OF ÆTHER.

The decomposition of alcohol into æther and water is not interesting merely by the production of æther, but is especially so as an example of a particular kind of decomposition, which cannot be so well followed with any other substance, and which is manifested in the formation of some important products, for example, in that of alcohol itself.

M. Mitscherlich, the well known chemist, has endeavoured to elucidate the phenomena of this decomposition by the following experiments:—Take a mixture of 100 parts of sulphuric acid, 20 of water, and 50 of anhydrous alcohol, and heat it gradually until its boiling point becomes 284 degrees Fahr. Alcohol is then allowed to fall gradually into the vessel which contains the mixture, and the current is to be so regulated that the heat of the mixture remains constantly at 284 degrees. If, for example, the operation be conducted with a mixture of six ounces of sulphuric acid, 1⅕ ounce of water, and 3 of alcohol, and if the density of each two ounces of product as it is obtained be taken, it will be observed that this density passes gradually from 0·780 to 0·788 and 0·798, and afterwards remains constantly at the last mentioned density, which is exactly that of the alcohol employed.

If the operation be properly conducted, an unlimited quantity of alcohol may be converted into æther, provided that the sulphuric acid does not change. The distilled liquor is formed of two distinct fluids; the upper one is æther, containing a little water and alcohol; the lower one is water, with a little alcohol and æther. Its weight is nearly equal to that of the alcohol employed, and it is composed of æther, 65; alcohol, 18; water, 17—100. If into six ounces of concentrated sulphuric acid six ounces of pure alcohol are suffered to flow gradually, a product of constant density is not obtained until the sulphuric acid has taken its proportion of water. Take, on the contrary, three ounces of sulphuric acid and two ounces of water, and let alcohol be added, drop by drop; the first two ounces distilled are merely spirits of wine of specific gravity 0·926, containing scarcely a trace of æther. The density decreases until the quantity of water of the sulphuric acid is reduced to its proportion, and the product of the distillation has acquired the density of the alcohol.

If concentrated sulphuric acid be added to anhydrous alcohol in excess, pure alcohol distils at first; but when the temperature reaches nearly 260 degrees, the first traces of æther begin to appear; the production of æther is at its maximum between 284 and 302 degrees. It results, from the preceding observations, that alcohol, when in contact with sulphuric acid, is converted into æther and water at a temperature of about 284 degrees.

OBERWESEL.

In descending the Rhine between Kaul and the Pfalzgrafenstein, the towers of Wesel are seen rising from a dark and rocky background, and above them the commanding ruins of the castle of Schönberg. This fortress was built by the Lords of Schönberg, who were all powerful during the middle ages in Wesel, and in the last centuries, under the title of Counts of Schömberg, were created grandees of Portugal, and peers of England, for their military deeds. The romantic spirit of the inhabitants of the Rhineland, however, derived the name or the castle from seven beautiful ladies who once inhabited it, and are said to have captivated every one who beheld them by their charms. On account of their vanity, these seven noble ladies are said to have been transformed into the seven pointed rocks which, at low water, are seen just below Wesel, and are called by the boatmen the "seven sisters." The tradition further says, that if these seven rocks were raised from the river-bed, and used to build a chapel, the "seven sisters" would be freed from the enchantment which at present enchains them. The situation of Oberwesel is one of the most romantic, and, to judge from the number of artists who visit it, picturesque parts of the Rhine valley. Above and below the town two green vine-covered valleys run into the hills, enclosing between them the old-fashioned buildings, the sombre turrets, tall spires, and quaint towers of Oberwesel. The churches are worthy of observation, especially the slender spire of the Church of our Lady, which attracts the attention of every passer by, by its singularly shaped tower. The interior of the church is most interesting to the antiquarian; the richly ornamented *lectorium*, and the carved altar, with its folding doors, in which designs are executed with a sharpness and beauty such as is even seldom seen in stone. Not far from this church stands the old gate, but the road no longer leads through its grey walls into the town. At the opposite end is a tower such as we find at Andernach: the most extensive view is, however, to be obtained from the church of St. Martin. The small old church, which is built into the wall, is said to have been dedicated to the memory of some children who were supposed to have suffered martyrdom at the hands of the Jews. Another curiosity of Oberwesel, and one which all visitors are taken to inspect, is the footprint of St. Hubert's horse in the market-place, although tradition does not state the manner in which it became impressed in the pavement.